

***Remarks***

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-8, 10 and 11 are pending in the application, with claim 1 being the independent claim. Claim 9 is sought to be canceled without prejudice to or disclaimer of the subject matter therein. This change is believed to introduce no new matter, and its entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

***I. Acknowledgment of Priority Document Under 35 U.S.C. § 119(a)-(d)***

Applicants appreciate the Examiner's acknowledgment of Applicants' claim for foreign priority under 35 U.S.C. § 119(a)-(d), and note that certified copies of the priority document were received.

***II. Rejections under 35 U.S.C. § 101 and 35 U.S.C. § 112***

Claim 9 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Additionally, claim 9 was rejected under 35 U.S.C. § 101 because the claim 9 allegedly recited a use without setting forth any steps involved in the process, resulting in an improper process claim.

Applicants respectfully traverse these rejections.

Claim 9 is sought to be canceled without prejudice to or disclaimer of the subject matter therein, thereby rendering moot the rejections of this claim. Therefore, Applicants

respectfully request that the rejection of claim 9 under 35 U.S.C. § 101 and 35 U.S.C. § 112, second paragraph, be withdrawn.

### ***III. Rejections under 35 U.S.C. § 102***

Claims 1-6 and 8-11 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,236,493 ("Schmidt").

Applicants respectfully traverse this rejection.

Applicants respectfully submit that Schmidt (U.S. Patent No. 6,236,493 B1) does not qualify as prior art under 35 U.S.C. § 102(b) because the publication date of Schmidt is not more than one year prior to Applicants' earliest priority date. However, Applicants note that the disclosure of Schmidt was published as a PCT application on October 16, 1997 (PCT Pub. No. WO97/38333). Therefore, Applicants respectfully request that the Examiner either make the Schmidt PCT publication of record or remove the present rejection under 35 U.S.C. § 102(b).

Assuming, *arguendo*, that the Examiner rejects the present claims under 35 U.S.C. § 102(b) in view of PCT Pub. No. WO97/38333 ("Schmidt"), for Schmidt to anticipate the present claims this reference by itself must either expressly or inherently disclose each and every element of the claims. *See Kalman v. Kimberly Clark Corp.*, 713 F.2d 760, 711 (Fed.Cir. 1983), *cert. denied*, 465 U.S. 1026 (1984).

The presently claimed invention requires a polymerizable nanocomposite material *in solid or gel form*. Conversely, Schmidt discloses a polymerizable nanocomposite *in liquid form*. Specifically, Schmidt discloses *a liquid matrix phase* that "permits adequate diffusion of the nanoscale particles . . . in other words, that the viscosity of the matrix phase is not excessively high." (Schmidt, at col. 2, ll. 30-33.) Nowhere does Schmidt

disclose that a *solid or gel* would be suitable for use as a matrix phase. In fact, Schmidt repeatedly discloses that materials having a high viscosity are unsuitable for use as matrix phases. (See Schmidt at, *inter alia*, col. 1, ll. 12-15; col. 1, ll. 20-28; col. 1, ll. 57-60; col. 2, ll. 27-33; col. 2, ll. 34-40; and col. 3, ll. 34-40.) While Schmidt does not explicitly disclose that a solid or gel cannot function as a matrix phase, Schmidt's emphasis on providing a matrix phase having a sufficiently low viscosity to permit diffusion of the nanoscale particles is an implicit disclaimer of both solid and gel phase materials, which are known to have high viscosity.

Furthermore, this difference between a *liquid matrix phase* as required by Schmidt and the *solid or gel phase* required by the presently claimed invention is reflected in the fact that the presently claimed invention requires from 4.9 to 95.9% by weight of a soluble polymer. Nowhere does Schmidt disclose a matrix phase containing a soluble polymer. On the contrary, Schmidt discloses numerous polymer *precursors* that are polymerized *in situ* to form a polymer matrix. However, polymerization of the precursors in Schmidt is performed only *after* the matrix has been applied to a substrate and diffusion of the nanoscale particles is complete. (See Schmidt Examples 1-5.) Nowhere does Schmidt disclose a matrix phase to which nanoscale particles are added after polymerization has been completed.

Moreover, Schmidt additionally teaches away from including a polymer in the liquid matrix phase. Specifically, Schmidt teaches that the matrix phase must have a low viscosity in order to permit diffusion of the nanoscale particles. Because a person of ordinary skill in the art would expect that the addition of a polymer to a liquid phase would increase the viscosity of the liquid phase, a person of ordinary skill in the art would have no reason to add a polymer to the matrix phase disclosed by Schmidt because

Schmidt explicitly discloses that this would be undesirable. Thus, Schmidt does not anticipate, nor make obvious, claim 1 of the present invention. Because claims 2-6, 8, 10 and 11 depend from claim 1 and incorporate all of the elements of claim 1, Schmidt does not anticipate claims 2-6, 8, 10 and 11 of the present invention. Additionally, claim 9 is sought to be canceled without prejudice to or disclaimer of the subject matter therein, thereby rendering moot the rejection of this claim.

Upon consideration of the above, Applicants respectfully request that the rejection of claims 1-6 and 8-11 under 35 U.S.C. § 102(b) in view of Schmidt be withdrawn.

#### ***IV. Rejections under 35 U.S.C. § 103***

Claims 1-11 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Schmidt in view of either JP 2000-302960 ("Awaji") or U.S. Patent No. 3,787,378 ("Blank").

Applicants respectfully traverse these rejections.

The Examiner bears the burden of establishing a *prima facie* case of obviousness based upon the cited art. *See In re Piasecki*, 745 F.2d 1468, 1471-72 (Fed. Cir. 1984). The Examiner must show reasons, explicit or otherwise, that would compel one of ordinary skill to combine the cited references in order to make and use the claimed invention. To determine whether there is "an apparent reason to combine" the known elements in the way a patent claims,

it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art . . . . To facilitate review, this analysis should be made explicit.

*KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. \_\_\_, 82 U.S.P.Q.2d 1385 (2007); *see also* the Memorandum from the United States Patent and Trademark Office, "Supreme Court decision on *KSR Int'l Co. v. Teleflex Inc.*," (May 3, 2007) ("The Court did not totally reject the use of 'teaching, suggestion, or motivation' as a factor in the obviousness analysis. . . . [I]n formulating a rejection . . . based upon a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.").

A prior art reference must be considered in its entirety, including portions that would lead away from the claimed invention. *See* M.P.E.P. § 2141.02(VI) (citing *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983)); *see also Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 1093-94 (Fed. Cir. 1985) ("The well established rule of law is that each prior art reference must be evaluated as an entirety . . . ."). "There is no suggestion to combine . . . if a reference teaches away from its combination with another source." *Tec Air, Inc. v. Denso Manufacturing Michigan Inc.*, 192 F.3d 1353, 1360 (Fed. Cir. 1999); *see also KSR*, 550 U.S. at \_\_\_, 82 U.S.P.Q.2d at 1396 (2007) (reaffirming "the corollary principle that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious") (citing *United States v. Adams*, 383 U.S. 39, 51-52 (1966)). "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, *or would be led in a direction divergent from the path that was taken by the applicant . . . .*" *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) (*emphasis added*).

The Examiner asserts that the difference between Schmidt and the presently claimed invention is that Schmidt fails to disclose softeners or plasticizers. To rectify this

deficiency the Examiner alleges it would have been obvious for a person of ordinary skill in the art to utilize a plasticizer or softener with the matrix phase of Schmidt because "plasticizers or softeners aid in the diffusion of the monomeric components with the polymeric matrix and may be [a] less expensive way of lowering [the] refractive index of the composition. At the same time adding softener or plasticizer results in the composition that is less rigid and softens at lower temperatures." (Office Action, p. 6. line 22 – p. 7, line 3.) The Examiner asserts that Awaji discloses the use of a plasticizer in an amount of 1-30% by weight based upon the weight of a matrix polymer and that Blank discloses the use of up to 20% by weight of plasticizer based on the weight of the matrix polymer.

As discussed above, Schmidt discloses a *liquid matrix* that contains a polymer precursor and an inorganic species. However, nowhere does Schmidt disclose a *gel or solid matrix* that contains a *polymer*, as is required by the presently claimed invention. Moreover, Schmidt teaches that the addition of polymers and the like (i.e., components that can excessively increase the viscosity of the liquid matrix) is unwanted and can lead to deleterious side effects due to the nanoscale particles being unable to diffuse through the liquid matrix. Conversely, both Awaji and Blank disclose polymer mixtures that can contain a softener or plasticizer. But because Schmidt teaches away from the inclusion of polymers in the liquid matrix, a person of ordinary skill in the art would have no reason to combine Schmidt with either of Awaji or Blank.

Moreover, the Examiner has failed to provide a reason as to why a person of ordinary skill would add a softener or plasticizer to a mixture that does not contain a polymer. The Examiner's argument that a person of ordinary skill would add a plasticizer or softener to aid in the diffusion of monomeric components within the polymeric matrix

and also may be a less expensive way of lowering the refractive index is purely hindsight on the part of the Examiner that utilizes Applicants' own disclosure as a blueprint. When prior art references require selective combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight obtained from the invention itself. It is critical to understand the particular results achieved by the new combination." *Interconnect Planning Corp. v. Feil*, 227 U.S.P.Q. 543 (Fed. Cir. 1985). Both Awaji and Blank disclose polymeric compositions that may optionally contain plasticizers and softeners, while Schmidt discloses liquid compositions that do not contain polymers. Outside of the disclosure of the presently claimed invention, there is no reason why a plasticizer or softener should be added to a matrix phase suitable for making a nanocomposite material. Therefore, in addition to failing to provide a reason why one of ordinary skill would combine the references cited, the Examiner has failed to show how the references themselves would teach or make obvious to one of ordinary skill a modification of the composition of Schmidt that would have resulted in the claimed invention.

In view of the above remarks Applicants assert that the Examiner has failed to establish a *prima facie* case of obviousness of claim 1 over any combination of the cited references because the combined references fail to teach or suggest all of the elements of claim 1. *See* M.P.E.P. § 706.02(j) and cases cited therein. Additionally, in combining the references the Examiner has used impermissible hindsight based upon Applicants' own disclosure. Therefore, Applicants submit that claim 1 is non-obvious over the cited references and request that the rejections of claim 1 under 35 U.S.C. § 103(a) be withdrawn.

Claims 2-8, 10 and 11 ultimately depend from claim 1, and claim 1 is non-obvious for the reasons provided above. Additionally, claim 9 is sought to be canceled without prejudice to or disclaimer of the subject matter therein, thereby rendering moot the rejection of this claim. Therefore, Applicants submit that claims 2-8, 10 and 11 are non-obvious over the cited references and request that the rejections under 35 U.S.C. § 103(a) be withdrawn.

***V. Other Matters***

Applicants acknowledge that the Examiner has made U.S. Patent Pub. No. 2006/0057395 ("Zimmerman") and U.S. Patent No. 7,108,810 ("Nakamura") of record. Applicants appreciate that the Examiner has noted that Zimmerman, which has a PCT filing date of March 14, 2003, does not qualify as prior art to the presently claimed invention under any section of 35 U.S.C. § 102.




***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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